Ames Laboratory

Iowa State University

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Andreas Kreyssig

Current Position

- Associate Scientist and Adjunct Assistant Professor, Ames Laboratory / Iowa State University

Background

- Associate Scientist, Ames Laboratory, 2008-present
- Adjunct Assistant Professor of Physics, Iowa State University, 2008-present
- Assistant Scientist, Ames Laboratory, 2006-2008
- Postdoctoral Fellow, University of Technology, Dresden, Germany, 2005-2006
- Postdoctoral Fellow, Ames Laboratory, 2004-2005
- Postdoctoral Fellow, University of Technology, Dresden, Germany, 2001-2004
- Graduate research, University of Technology, Dresden, Germany, 1993-2001
- Undergraduate research, Research center GKSS Geesthacht, University of Hamburg, Germany, 1991
- Undergraduate research, University of Technology, Dresden, Germany, 1990-1992

Activities

- Member of organization committee for the Workshop on New Directions for High-Pressure Neutron Research, Oak Ridge, 2013
- Reviewer of research project proposals, Basic Energy Sciences, U.S. Department of Energy, 2011-present

Member of Advisory Committee for Sector 6 at the Advanced Photon Source, 2009-present

- Member of Safety Review Committee, Ames Laboratory, 2009-present
- Member of proposal committee for triple-axis and time-of-flight spectrometer at Oak Ridge National Laboratory, 2008–2012
- Reviewer for Physical Review Letters, Physical Review B, *Journal of Magnetism and Magnetic Materials*, 2004-present
- Head of organization committee for the German Conference on Neutron Scattering, Dresden; 2004
- Member of proposal committee for magnetic order at Institute Laue-Langevin, Grenoble; 2002–2004

Interests

- Study of magnetic and crystallographic order, excitations and their relation to physical properties in high-temperature superconductors, multiferroic, magneto-caloric, intermetallic compounds and oxides, in undercooled liquids, quasicrystals and related compounds
- Investigation of periodic arrangement and fractal order of crystallographic and magnetic domains and twin arrangements, their modification by mechanical stress and applied magnetic field, and their influence on electronic and transport properties
- Using diffraction, spectroscopy and small-angle scattering methods using x-ray, neutrons, and synchrotron radiation on samples in complex environments (temperature, magnetic field and pressure)
- Resonant magnetic x-ray scattering
- Employment of a contact-free high-temperature furnace realized by electro-static levitation, high-energy x-ray scattering and tunnel-diode oscillation measurements
- Development and realization of a high-energy x-ray precession camera for efficient recording of entire reciprocal scattering planes

Goals

In the more than 20 years of my condensed-matter research I have been employing a wide set of scattering techniques using x-ray, neutrons, and

synchrotron radiation in concert with measurements of magnetic, thermodynamic, and transport properties and modeling. Numerous experiments at the European and American scattering centers gave me broad insight in the opportunities and challenges of user activities at large-scale facilities. In my recent activities in the scattering group at Ames Laboratory and Iowa State University and extensive use of the Advanced Photon Source, I have experienced the challenge to bridge the gap between having instrumentation of recent top-notch developments available and using them efficiently for research by the user community. My goal is to bring both sides better together by communicating and improving key elements like accessibility and support by beamline specialists and central groups before, during, and after experiments. The development, installation, and optimization of robust sample environments and multi-dimensional detector systems are increasingly important tasks employing the broad capabilities of the Advanced Photon Source now and in future through the Upgrade Project for general, resonant, inelastic, and high-energy x-ray scattering in condensed matter research.